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ronment. Thus mutation may multiply species without necessitating the extinction of any or requiring the erection of barriers spacial or physiological between the new form and the old one to prevent the swamping of the new form by crossbreeding. A real obstacle to the older ideas about evolution has thus been removed by fuller knowledge of the laws of inheritance of mutations.

Though a mutation differs from the parent species at first in a single character only, the number of differences is likely to increase, for one mutation leads to another, as observation clearly shows. Accordingly natural selection is presently called upon to make a choice, not simply between *two* alternative forms, but among several distinct and mutually exclusive types, some one of which will be better adapted to a particular environment than any other.

The adaptations of organisms are almost endless and involve the most minute details of structure and function, yet the two principles of mutation and of exclusive inheritance are sufficient, in Morgan's opinion, to account for them all. Natural selection acting merely on the fluctuating variations of individuals fails to do this.

In justice to Darwin it should be said that the mutation or sport forming tendency of species was distinctly recognized by him, but he attached less importance to the process than do Bateson and deVries. The position taken by these writers, and emphasized by Morgan, is that mutations are the *exclusive* source of the material on which natural selection acts in the production of new species.

A serious defect of the book from the student's standpoint is the total omission of bibliographic references.

W. E. C.

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## ZOÖLOGY

**Zoölogical Investigations in the Malay Archipelago.**— Under the auspices of the universities of Edinburgh and of Liverpool, N. Annandale and H. C. Robinson undertook an expedition in 1901–1902 for anthropological and zoölogical investigations in the Malay Archipelago, and some of the zoölogical results of their work have recently appeared in two fascicles.<sup>1</sup> The first contains a report

<sup>1</sup>Annandale, N., and Robinson, H. C. *Fasciculi Malayenses. Zoölogy.* Parts I, II, and Supplement. London. Longmans, Green & Co., 4<sup>o</sup>, vii + 307 pp., 14 pls.; xliii pp., map.

on the mammals by J. L. Bonhote. In the considerable list of species reported there are a new species of small carnivore, a new bat, a new squirrel, and three new species of rats. C. Swinhoe reports on something over 250 species of moths, of which seventeen are new. Two land planarians, one of which is new, are described by F. F. Laidlaw, who also reports on the dragonflies. Three new diptera pupipara are recorded by Speiser. G. A. Boulenger reports 85 species of batrachians and reptiles, six of which are new. The tiger beetles are described by H. C. Robinson.

The second part contains nine short papers: four on insects, two on fishes, and one each on mollusks, the mouth funnel of a tadpole, and a fossil elephant tooth. In a report on the non-operculate pulmonates W. E. Collinge gives a full account of the anatomy of a new and very large species of *Atropos*; and in J. Johnstone's paper on the marine fishes, an interesting description of a new species of *Periophthalmus* is given. Its life on the mud flats out of water and its burrows are fully described and illustrated. The fact that when in the air it does not respond to the report of a gun led to the conclusion that it was absolutely deaf. Its eyesight both in water and in air was acute.

The two fascicles were accompanied by a supplement containing a map and an itinerary.

**Davison's Anatomy of the Cat.**—As an introduction to the study of zoölogy and particularly to mammalian anatomy, Davison<sup>1</sup> has prepared an account of the anatomy of the cat. The volume, which contains some 250 pages with above 100 illustrations, is unsatisfactorily brief and in consequence it is deficient as a description of the anatomy of a type and as an introduction to comparative study. Although brevity may have been the aim of the author and certain defects may therefore have been unavoidable, others are present in the volume for which no such excuse can be found. Thus the description of the gastrocolic omentum as a *closed* sac is wholly misleading, and the grouping together of the corpora quadrigemina, optic thalami, and corpora striata as basal ganglia counteracts what has been gained for these bodies from the standpoint of comparative anatomy. The facial nerve is placed without qualification among the pure motor nerves, and the circumvallate papillae of the tongue are noted as eight to twelve in number, as in man, though the figure

<sup>1</sup>Davison, A. *Mammalian Anatomy* with special Reference to the Cat. Philadelphia, P. Blakiston's Son & Co., 8°, xii + 250 pp., 108 figs.